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Do changes in selfishness explain 12-step benefit? : A prospective lagged analysis

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Abstract

Objective—12-step attendance is associated with increased abstinence. A strong claim made in 12-step literature is that alcoholics are pathologically selfish and that working the 12 steps reduces this selfishness which, in turn, leads to sustained alcohol abstinence. This study tested this assumption by investigating the linkages between 12-step attendance, pathological narcissism, and drinking.

Method—130 early AA affiliates with limited AA and treatment histories were recruited from treatment and community-based AA. A majority of the sample was alcohol dependent and reported illicit drug use before recruitment. Participants were interviewed at intake and at 3, 6, and 9 months.

Results—A majority of participants attended AA meetings throughout follow-up and such attendance predicted increased abstinence and reduced drinking intensity. 12-step affiliates were significantly higher on pathological narcissism (PN) relative to general population samples and their PN remained elevated. Contrary to predictions, PN was unrelated to 12-step meeting attendance and did not predict later abstinence or drinking intensity.

Conclusion—Findings did not support the hypothesis that reductions in PN explain 12-step benefit. An alternative function for the emphasis placed on pathological selfishness in 12-step programs is discussed and a recommendation is made to use unobtrusive measures of selfishness in future research.

Keywords

self-help; AA; mediator

Adults with alcohol and illicit drug problems frequently seek help by attending community-based 12-programs and a majority of treatment providers encourage 12-step meeting attendance both during and after treatment (Kelly et al., 2008). Meta-analytic reviews have concluded that frequency of 12-step attendance is associated with increased alcohol abstinence (e.g., Tonigan, Toscova, & Miller, 1996), and recent prospective investigations

support the view that 12-step attendance is helpful for many substance abusers trying to reduce their use of alcohol and illicit drugs (Kaskutas, et al., 2002; Kelly et al., 2010; Moos and Moos, 2006; Timko et al., 2000; Tonigan & Beatty, 2011; Weiss et al., 2005; Worley et al., 2008). Having documented the nature and magnitude of 12-step related benefit, investigators have recently turned to identifying *why* 12-step participation is predictive of reductions in substance use. Strong support has been found for several change mechanisms that are *common* across different approaches for treating substance misuse. The direct effect of 12-step attendance on later increases in abstinence, for example, have been explained by increased abstinence self-efficacy (see Forcehimes & Tonigan, 2008 for a meta-analytic review) and social support for abstinence (Bond et al., 2003; Kaskutas et al., 2002; Kelly, Stout, Magill, & Tonigan, 2011; Laudet, Cleland, Magura, Vogel, & Knight, 2004.)

It is important to recognize that 12-step programs are grounded in, and guided by, a core literature. 12-step programs claim, for example, that they work by strengthening members' spiritual beliefs and by decreasing selfishness, anger, and depression (AA, 2001). These claims have received mixed empirical support. For example, six studies have found that changes in spiritual and religious beliefs and practices explain, in part, increased abstinence among 12-step members (e.g., Oakes, 2008; Kaskutas et al., 2003; Robinson et al., 2007; Zmore, 2007; Kelly et al., 2011). However, anger and depression have not proven to significantly mediate associations between 12-step involvement and increased abstinence (Kelly et al; 2010; Kelly et al., 2011).

In spite of the centrality of selfishness as a change agent in the 12-step literature it has received little empirical attention. A passage in AA's "Big Book" reads "Selfishness – self-centeredness! That, we think, is the root of our troubles... Above everything, we alcoholics must be rid of this selfishness. We must, or it kills us!" (AA, 2001, p. 62). Also according to 12-step ideology, commitment to, and practice of, prescribed 12-step behaviors and beliefs leads to reductions in selfishness – albeit one day at a time. To date, most studies investigating selfishness among 12-step members have used psychoanalytic frameworks that operationally defined selfishness as sharing many features with pathological narcissism (Tiebout, 1944; Johnson, 1993; Flores 1988; Dodes, 1998). Distinct from healthy narcissism, the dimensions of pathological narcissism deemed most relevant in these investigations have included excessive self-grandiosity and preoccupation, exploitiveness, arrogance, and entitlement.

Three studies have specifically investigated pathological and non-pathological narcissism among 12-step members (Reinert et al., 1993; Reinert et al., 1995; Hart & Huggett, 2005). All studies used the Narcissistic Personality Inventory (Raskin & Terry, 1988) to measure these constructs, with pathological narcissism defined as the sum of the Entitlement, Exploitiveness, and Exhibitionism NPI subscales. In the first of two studies, Reinert and colleagues (1993) used a cross-sectional design and reported that extent of involvement in prescribed 12-step practices among 107 AA members was unrelated to NPI pathological narcissism scores. This finding was counter to their prediction that greater engagement in 12-step practices would be associated with less pathological narcissism. Likewise in their second study of 45 AA members, Reinert et al. (1995) found that NPI pathological narcissism scores did not decline over a three-month period, either overall or as a function of

self-reported engagement in 12-step prescribed practices. Finally, Hart & Huggett (2005) investigated the association between willingness to complete the surrender steps and non-pathological (NP) narcissism. The NPI was used to measure NP narcissism in 29 adults in treatment, 80% of whom reported past or current AA attendance. Based on the assumption that higher NP narcissism reflected less humility, the authors predicted that NP narcissism and surrender step work would be negatively related. Results showed that completion of steps 2 and 3, but not of step 1, was negatively correlated with NP narcissism.

The preceding evidence cast doubt on the assertion that changes in pathological narcissism explain 12-step related benefit. There are at least four reasons to think that this conclusion is premature. First, formal treatment of pathological narcissism often requires intensive and extended clinical care. It seems unlikely that changes in pathological narcissism would occur in the course of a three-month study. Related, it is well documented that 12-step affiliates commonly seek formal treatment for depression and comorbid disorders concurrent to their 12-step involvement, (e.g., Tonigan & Rice, 2010; Tonigan & Beatty, 2011) and failure to account for these treatment experiences may have obscured important nuances in the relationships of interest. AA itself reports, for example, that 63% of its members seek formal therapy for emotional problems and of these members, 86% report that such counseling was very helpful (AA, 2007). Second, previous studies were statistically underpowered. For example, Reinert and colleagues (1995) reported that AA members low ($n = 23$) and high ($n = 19$) in AA practices did not differ in pathological narcissism, and they concluded that AA prescribed practices were unrelated to reductions in pathological narcissism. The effect size of high-low AA practices on pathological was $d = .35$ with high-engagement AA members reporting lower pathological narcissism scores, however. Many would regard Reinert et al.'s (1995) failure to reject the null hypothesis a Type II error. Third, no studies have controlled for participants' prior AA histories and current participation in formal treatment when investigating narcissism. Thus, it is unclear what portion of variance in narcissism was attributable to current AA involvement and what portion was explained by past AA or current treatment participation. Finally, previous studies have not investigated lagged associations between pathological narcissism and alcohol use or controlled for participants' length of abstinence. In the Reinert et al. (1995) study, for example, the group that had "low" AA involvement reported, on average, two years of abstinence while the group that had "high" AA involvement reported over six years of sobriety. The absence of drinking among any of the study participants may have introduced unintended ceiling effects.

The purpose of this study was to formally and prospectively test whether reductions in pathological narcissism over nine months explained increased abstinence among 12-step members. Using Baron and Kenny's (1986) four-step method for testing statistical mediation, we evaluated four specific hypotheses, namely that (1) 12-step attendance would predict later increases in alcohol abstinence, (2) 12-step attendance would predict later reductions in pathological narcissism, (3) reductions in pathological narcissism would predict later drinking reductions, and (4) the direct effect of 12-step attendance on abstinence would significantly decrease after taking into account changes in pathological narcissism. Our study was designed to correct flaws in previous investigations. We ensured that participants had limited prior histories with treatment and 12-step programs, included concurrent treatment attendance as a time-varying control variable, a longer interval of time

was used to assess changes in pathological narcissism, and recruited a sample of community-based 12-step participants who were representative of the overall population of 12-step members.

Method

Participants

Participants were 130 adult's attending AA. Eligibility criteria were narrow in terms of lifetime and recent treatment and AA experiences. Prospective participants were excluded if they reported more than 16 weeks of lifetime AA attendance and/or if they reported having achieved alcohol abstinence for 12 months or longer after they had first determined that alcohol use had become a problem. Participants were required to meet current *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association [DSM-IV-TR], 2000) criteria for alcohol abuse or dependence and had to have used alcohol in the prior 90 days. Participants also were required to have attended at least one AA meeting in the prior 3 months. Illicit drug use was documented, but was not considered a criterion for exclusion.

Procedures

Participants were recruited from outpatient substance abuse treatment, community-based AA clubs, and via advertisement. Initial screening was done at each recruitment site, but in-depth screening to determine eligibility, consenting, and later assessments were conducted at the research center. Once consented, participants completed the intake interview. Follow-up assessments were done at 3, 6, and 9 months. Preference was given to conducting follow-up interviews in-person; however, telephone interviews were used if in-person interviews were not possible. If participants missed an interview but were successfully interviewed at a later follow-up point, the data were retrospectively reconstructed. At 3 months, 97 participants (75%) were interviewed and 21 participants reconstructed the 3-month interview during a later assessment (16%). At 6 months, 100 participants were successfully interviewed (77%) and fourteen participants (10.8%) reconstructed data for the 6-month assessment at 9 months. At the 9-month interview, 86.9% ($n = 113$) of the participants completed interviews. Participants were reimbursed \$50 for each assessment. All procedures and assessments were approved by the institutional review board at the University of New Mexico (UNM Protocol # 27147).

Assessments

Participants took approximately two hours to complete the baseline interview, which included 12 self-report questionnaires, three semi-structured interviews, and a urine toxicology screen for five classes of illicit drugs. Follow-up interviews were shorter in duration. Only those measures central to the aims of this study are described.

Substance Use—The *Form 90* was used to collect daily alcohol and illicit drug use (Miller, 1996). The *Form 90* has strong test-retest reliability for measuring self-reported drinks per drinking day ($ICC = .71$) and days abstinent from alcohol ($ICC = .85$; Tonigan et al., 1997). Two outcome measures of substance use were computed from *Form 90* data in the

current study: proportion of days abstinent from alcohol (PDA) and drinks per drinking day (DPDD). PDA was defined as the number of days abstinent from alcohol divided by the total number of days in the period. DPDD were defined as the number of standard drinks consumed per drinking day divided by the number of drinking days in a period (abstinent days excluded in the denominator). *Urine toxicology screens* were collected at the intake and 9-month interviews using the iCassette Drug Screen-4 Panel Test (i-DOA-1145; Instant Technologies, Inc., Norfolk, VA).

Formal and Informal Health Care—The *Form 90* was used to measure the frequency with which participants received formal and informal health care. The number of days that participants received treatment for alcohol, drug, and emotional problems were summed and divided by the total number of days in the period to calculate the proportion of days that a participant obtained formal treatment. The *Form 90* interview also was used to measure the proportion of days of 12-step attendance. To derive this proportion, the total number of 12-step attendance days reported in a period was divided by the total number of days in an assessment window.

Narcissistic Personality Inventory (NPI)—The NPI (Raskin & Terry, 1988) is a 40-item self-report questionnaire that solicits binary responses (yes/no) to 40 statements. The NPI has 7 scales, three of which are used to define pathological narcissism: Entitlement (6 items; “I insist upon getting the respect that is due me”), Exploitativeness (5 items; “I find it easy to manipulate people”), and Exhibitionism (7 items; “I really like to be the center of attention”). The four remaining NPI scales are often used to define healthy narcissism and include: Vanity (3 items), Authority (8 items), Self-sufficiency (7 items), and Superiority (4 items). Several studies have evaluated the psychometric properties of the NPI using diverse samples (e.g., Tschanz et al., 2004). Results have shown that inter-item consistency and test-retest reliability of NPI scales are good.

Statistical Methods

The distributions of the two drinking outcome variables and the 12-Step attendance independent variable were significantly non-normal. Thus, we arcsine transformed PDA, square-root transformed DPDD, and log transformed the proportion of 12-Step attendance days. For ease of interpretation the untransformed value of each of the variables is included in Table 1. Applying Baron and Kenny’s (1986) approach we conducted four GLM-based lagged prospective analyses that tested whether: (1) proportion days of 12-step attendance from baseline to 3 months predicted PDA and DPDD in months 7–9, (2) proportion days 12-step attendance from baseline to 3 months predicted changes in the 6-month NPI pathological score from baseline, (3) changes in the NPI pathological scores at 6 months predicted PDA and DPDD in months 7–9, and (4) using the product coefficient approach we tested whether changes in NPI pathological scores from baseline to 6 months reduced the effect of early 12-Step attendance on later drinking. To isolate the effect of 12-step participation on NPI scores we controlled for concurrent therapy throughout the nine-month study. This was done by adding a lagged time-varying covariate to all analyses that represented the proportion of days in an assessment period that participants received formal treatment for alcohol, drug, and/or emotional problems.

Results

There were 130 participants recruited from three sources: community-based AA (24%, $n = 31$), word of mouth and advertising (25%, $n = 33$), and substance abuse treatment (51%, $n = 66$). A majority of the participants were male (53%, $n = 69$), 35% ($n = 46$) were non-Hispanic White, 43% were Hispanic ($n = 56$), and 15% were Native American ($n = 20$). The average age of participants was 38.65 years ($SD = 9.60$), and participants ranged in age from 19 to 64 years. Table 1 displays the formal and informal help seeking and alcohol use of the participants over the course of the study. As shown, participants reported attending a 12-step meeting about once every five days, and a majority of the participants reported attending both community-based 12-step programs and formal treatment over the course of the study. Participants had significant pre-post reductions in alcohol use. Specifically, their proportion of abstinent days increased from .56 at intake to .72 at nine months [$t(112) = -5.33$, $p < .001$], and drinking intensity declined from 14.01 standard drinks per drinking episode to 8.60 standard drinks per episode at nine-months, $t(112) = 5.90$, $p < .001$. Controlling for 12-step attendance and formal treatment experiences, pre-post group means on the NPI-pathological scale were not significantly different, $t(108) = .24$, $p = .81$.

Hypothesis 1

The lagged effect of 12-step attendance (months 0–3) on PDA and DPDD (months 7–9) was examined using GLM ($N = 91$), with the baseline value of the outcome measure entered as a covariate as well as the proportion of formal treatment days as a time-varying covariate (months 0–9). 12-step attendance was a significant predictor of later increases in PDA, $\chi^2(1) = 10.63$, $p < .001$ ($b = .29$, $SE = .09$), even after controlling for baseline PDA and concurrent formal treatment. Likewise, increased 12-step attendance was significantly predictive of later decreases in DPDD after taking into account the two control variables, $\chi^2(1) = 5.46$, $p < .019$ ($b = -.71$, $SE = .30$).

Hypotheses 2a and 2b

In accordance with 12-step ideology, we hypothesized that (a) alcoholics would enter the 12-step program with higher levels of pathological narcissism than healthy populations without alcohol use or substance use disorders, and (b) such selfishness would be reduced through 12-step participation. To test Hypothesis 2a we compared the mean of participants' total NPI scores to the mean scores of 16,475 participants in a recent meta-analysis of 65 studies of narcissism among college students published between 1979 and 2006 (Twenge et al., 2008). Table 2 shows the intake means and standard deviations of the total NPI scores and the pathological narcissism subscale scores for the current study sample. Also shown in Table 2 are the weighted means for these two scales as reported by Twenge et al., (2008). Hedges' g was calculated to determine the effect size and significance of the difference between the 12-step sample and Twenge et al.'s (2008) weighted distribution. On average, our 12-step sample reported significantly higher scores on both the total NPI ($g = 1.25$, $p < .0001$) and pathological narcissism ($g = 1.38$, $p < .0001$) scales relative to college student responses.

To test Hypothesis 2b, we conducted GLM analyses to determine if changes from intake to six months in pathological narcissism scores could be attributed to 12-step attendance in

months 0 through 3 ($N = 91$). 12-step attendance did not predict changes in pathological narcissism, $\chi^2(1) = .33, p < .57$. The only significant predictor of six-month pathological narcissism in the model was the baseline value of the outcome measure, ($b = .57, SE = .09, \chi^2(1) = 43.21, p < .001$). Post-hoc analyses using hierarchical linear growth modeling were done to assess how, at the individual level, pathological narcissism changed from intake to the nine-month follow-up ($N = 130$). The linear effect of time was not significant, ($b = .002, SE = .10; t(458) = .017, p < .99$, indicating that self-reported pathological narcissism was relatively stable *within* participants over time.

Hypothesis 3

GLM was used to determine if pathological narcissism scores predicted nine-month PDA or DPDD. In the first model ($N = 109$), nine-month PDA was not predicted by either intake ($b = .002, SE = .02, \chi^2(1) = .02, p < .88$) or six-month ($b = -.01, SE = .01, \chi^2(1) = .31, p < .58$) pathological narcissism scores after controlling for baseline PDA and concurrent formal treatment. Likewise, both intake and six-month pathological narcissism scores were unrelated to nine-month DPDD after controlling for intake DPDD and concurrent formal treatment (intake: $b = -.02, SE = .05, \chi^2(1) = .17, p < .68$; six-months: $b = .002, SE = .05, \chi^2(1) = .001, p < .98$).

Hypothesis 4

Given the insignificant results in tests of hypotheses 2 and 3, we did not test whether entering pathological narcissism as a mediator would significantly decrease the association between 12-step attendance and drinking outcomes at the 9-month follow-up.

Discussion

No support was found for the claim that reductions in pathological narcissism explain increased abstinence among 12-step participants. However, consistent with 12-step ideology (AA, 2001), we did find that, on average, early 12-step affiliates had significantly greater pathological narcissism than did population samples without AUDs or SUDs. 12-step attendance was not predictive of *changes* in pathological narcissism, however, and pathological narcissism scores did not change over nine-months among study participants. Finally, we found no support for the hypothesized linkage between pathological narcissism and later drinking as predicted in the 12-step literature.

Our findings are consistent with prior work, and the application of a prospective fully-lagged design in this study provides a strong argument not to further investigate *pathological narcissism* as a change mechanism in 12-step programs. Similar to the current study, Reinert et al. (1995) found that pathological narcissism of 12-step exposed adults did not change over three months. Our work suggests that Reinert et al.'s findings generalize to early 12-step affiliates and that pathological narcissism remains stable over nine months despite regular and high levels of 12-step attendance. Indeed, only nine participants in our study reported immediate 12-step disaffiliation and a full 64% reported attending 12-step meetings at all follow-up interviews. In this regard, one may be reasonably confident that our study participants received a moderate to high "dosage" of 12-step practice. The fact that this level

of 12-step attendance did not produce changes in pathological narcissism makes it doubtful that decreased narcissism is a significant mechanism of 12-step-related change.

The use of the NPI (Raskin & Terry, 1988) to define selfishness has merit, and it has been the choice of several investigative teams (Hart & Huggett, 2005; Reinert et al., 1993; Reinert et al., 1995). Item content in the NPI Entitlement and Exploitative scales, for example, closely parallel statements pertaining to selfishness in the 12-step literature. We wonder if this close correspondence in content may have been counterproductive to the aims of this study. Specifically, the belief that alcoholics are inherently selfish is ubiquitous in both the 12-step literature and discussions in meetings. Face-valid measures of selfishness are therefore likely to be endorsed by 12-step affiliates simply because they affirm affiliates' new and developing self-identities. In this light, self-report measures of selfishness may produce a high percentage of false positives and, as a result, they may be poor measures of change in selfishness. For this reason, we recommend that future research use less self-referential and obtrusive measures of selfishness.

Several features of our study enhanced internal validity, including our control of concurrent formal treatment attendance and history of AA involvement and our use of a fully-lagged prospective design. However, these features may also have limited the generalizability of our findings. It is often the case, for instance, that individuals cycle through extended periods of drinking and abstinence, with 12-step meetings and treatment accessed as required. For 12-step affiliates with longer histories of 12-step involvement, the effects of 12-step exposure may be additive and thus have a stronger influence on selfishness over longer periods of time. Second, it is important to acknowledge that different measures of 12-step participation and outcome may yield different conclusions. Composite measures of 12-step practice (e.g., Humphreys et al., 1998; Kelly et al., 2011; Tonigan et al., 1996), for example, are often stronger predictors of alcohol abstinence than are the measures of frequency of 12-step meeting attendance that we used in the current study. However, given that 12-step practices and meeting attendance are positively correlated, especially during early 12-step affiliation (e.g., Connors et al., 2001), we suspect that using a more comprehensive measure of 12-step participation would not have changed our results.

Why *is* selfishness a primary focus in 12-step programs when it appears to have little merit in predicting later alcohol use and it is not influenced by the practice of prescribed 12-step activities? A possible reason may be that the ubiquitous message that alcoholics are inherently selfish in 12-step programs resonates well with early 12-step affiliates. Indeed, on average, 12-step members report relatively high pathological narcissism scores in comparison to general population samples. The focus on selfishness in 12-step programs may thus serve to enhance personal identification with the 12-step fellowship and indirectly sustain 12-step affiliation. Using this reasoning, one might argue that early pathological narcissism would prospectively predict higher rates of 12-step attendance. However, post hoc analyses do not support this hypothesis. Specifically, in testing this implication we found that participants' pathological narcissism scores at baseline and in months 3 and 6 did not predict later 12-step attendance at months 3, 6, and 9 in a lagged HLM analysis, $b = -0.002$, $t(331) = -0.543$, $p < .59$. Again, it is unclear whether using less self-referential measures of selfishness such as third-party reports or observational assessments would yield

different conclusions. Nevertheless, our findings do suggest that the role and influence, if any, of selfishness in 12-step recovery is complex and most likely moderated by individual and contextual factors.

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References

- Alcoholics Anonymous World Services. Alcoholics Anonymous: Big Book. 3. New York, NY: Author; 2001.
- Alcoholics Anonymous General Service Office. AA Pamphlet P-48 Alcoholics Anonymous 2007 Membership Survey. 2007. http://www.aa.org/pdf/products/p-48_07survey.pdf
- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4. Washington, DC: 2000. Text Revision
- Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*. 1986; 51(6):1173–1182. [PubMed: 3806354]
- Bond J, Kaskutas L, Weisner C. The persistent influence of social networks and Alcoholics Anonymous on abstinence. *Journal of Studies on Alcohol*. 2003; 64(4):579–588. [PubMed: 12921201]
- Connors GJ, Tonigan JS, Miller WR. A longitudinal model of AA affiliation, participation, and outcome: Retrospective study of the Project MATCH outpatient and aftercare samples. *Journal of Studies on Alcohol*. 2001; 62(6):817–825. [PubMed: 11838919]
- Dodes LM. The psychology of combining dynamic psychotherapy and Alcoholics anonymous. *Bulletin of the Menninger Clinic: A Journal for the Mental Health Professionals*. 1988; 52(4):283–292.
- Hart KE, Huggett C. Narcissism: A barrier to personal acceptance of the spiritual aspect of Alcoholics Anonymous. *Alcoholism Treatment Quarterly*. 2005; 23(4):85–100.
- Humphreys K, Kaskutas LA, Weisner C. The Alcoholics Anonymous Affiliation Scale: Development, Reliability, and Norms for Diverse Treated and Untreated Populations. *Alcoholism: Clinical and Experimental Research*. 1998; 22(5):974–978.
- Flores PJ. Alcoholics Anonymous: A phenomenological and existential perspective. *Alcoholism Treatment Quarterly*. 1988; 5:73–95.
- Forcehimes A, Tonigan JS. Self-Efficacy to Remain Abstinent and Substance Abuse: A Meta-Analysis. *Alcoholism Treatment Quarterly*. 2008; 26:4.
- Johnson B. A developmental model of addictions and its relationship to the twelve step program of Alcoholics Anonymous. *Journal of Substance Abuse Treatment*. 1993; 10:23–34. [PubMed: 8450570]
- Kaskutas LA, Bond J, Humphreys K. Social networks as mediators of the effect of Alcoholics Anonymous. *Addiction*. 2002; 97(7):891–900. [PubMed: 12133128]
- Kaskutas LA, Turk N, Bond J, Weisner C. The role of religion, spirituality and Alcoholics Anonymous in sustained sobriety. *Alcoholism Treatment Quarterly*. 2003; 21(1):1–16.
- Kelly JF, Stout R, Magill M, Tonigan JS, Pagano ME. Mechanisms of behavior change in alcoholics anonymous: does Alcoholics Anonymous lead to better alcohol use outcomes by reducing depression symptoms? *Addiction*. 2010; 105(4):626–636. DOI: 10.1111/j.1360-0443.2009.02820 [PubMed: 20102345]
- Kelly JF, Stout RL, Magill M, Tonigan JS. The Role of Alcoholics Anonymous in Mobilizing Adaptive Social Network Changes: A Prospective Lagged Mediation Analysis. *Drug and Alcohol Dependence*. 2011; 114:119–126. [PubMed: 21035276]

- Kelly JF, Stout RL, Magill M, Tonigan JS, Pagano ME. Spirituality in recovery: A lagged meditational analysis of Alcoholics Anonymous' principal theoretical mechanism of behavior change. *Alcoholism: Clinical and Experimental Research*. 2011; 35(3):454–463.
- Kelly JF, Stout RL, Tonigan JS, Magill M, Pagano ME. Negative affect, relapse, and Alcoholics Anonymous (AA): Does AA work by reducing anger? *Journal of Studies on Alcohol and Drugs*. 2010; 71(3):434–444. [PubMed: 20409438]
- Kelly JF, Urbanoski KA, Hoepfner BB, Slaymaker VJ. Facilitating comprehensive assessment of 12-step experiences: A multidimensional measure of mutual-help activity. *Alcoholism Treatment Quarterly*. 2011; 29(3):181–203. [PubMed: 22081741]
- Kelly JF, Yeterian JD, Myers MG. Treatment staff referrals, participation expectations, and perceived benefits and barriers to adolescent involvement in twelve-step groups. *Alcoholism Treatment Quarterly*. 2008; 26(4):427–449. DOI: 10.1080/07347320802347053
- Laudet A, Cleland C, Magura S, Vogel H, Knight E. Social Support Mediates the Effects of Dual-Focus Mutual Aid Groups on Abstinence from Substance Use. *American Journal of Community Psychology*. 2004; 34(3):175–185. [PubMed: 15663205]
- Miller, WR. NIAAA Project MATCH Monograph Series. Vol. 5. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism; 1996. Form 90: A structured assessment interview for drinking and related behaviors.
- Moos RH, Moos BS. Participation in treatment and Alcoholics Anonymous: A 16-year follow-up of initially untreated individuals. *Journal of Clinical Psychology*. 2006; 62:735–750. X. [PubMed: 16538654]
- Oakes KE. Purpose in life: A mediating variable between involvement in Alcoholics Anonymous and long-term recovery. *Alcoholism Treatment Quarterly*. 2008; 26(4):450–463.
- Raskin R, Terry H. A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology*. 1988; 54(5):890–901. [PubMed: 3379585]
- Reinert DF, Allen JP, Fenzel LM, Estadt BK. Alcohol recovery in self-help groups: Surrender and narcissism. *Journal of Religion and Health*. 1993; 32(4):299–308. [PubMed: 24271552]
- Reinert DF, Estadt BK, Fenzel LM, Allen JP, Gilroy FD. Relationship of surrender and narcissism to involvement in alcohol recovery. *Alcoholism Treatment Quarterly*. 1995; 12(1):49–58.
- Robinson E, Cranford J, Webb J, Brower K. Six-month changes in spirituality, religiousness and heavy drinking in a treatment-seeking sample. *Journal of Studies on Alcohol and Drugs*. 2007; 68(2):282–290. [PubMed: 17286347]
- Snow MG, Prochaska JO, Rossi JS. Processes of change in Alcoholics Anonymous: Maintenance factors in long-term sobriety. *Journal of Studies on Alcohol*. 1994; 55:362–371. [PubMed: 8022185]
- Tiebout HM. Therapeutic mechanisms of Alcoholics Anonymous. *American Journal of Psychiatry*. 1944; 100:468–473.
- Timko C, Moos R, Finney J, Lesar M. Long-term outcomes of alcohol use disorders: Comparing untreated individuals with those in Alcoholics Anonymous and formal treatment. *Journal of Studies on Alcohol*. 2000; 61(4):529–540. [PubMed: 10928723]
- Timko C, Finney JW, Moos RH. The 8-year course of alcohol abuse: Gender differences in social context and coping. *Alcoholism: Clinical and Experimental Research*. 2005; 29:612–621.
- Tonigan JS, Beatty G. Twelve-Step Attendance and Polysubstance Use: Interplay of Alcohol and Illicit Drug Use. *Journal of Studies on Alcohol and Drugs*. 2011; 72(5):864–871. [PubMed: 21906513]
- Tonigan JS, Miller WR, Brown JM. The reliability of form 90: An instrument for assessing alcohol treatment outcome. *Journal of Studies on Alcohol*. 1997; 58(4):358–364. [PubMed: 9203116]
- Tonigan JS, Rice SL. Is it beneficial to have an AA sponsor? *Psychology of Addictive Behaviors*. 2010; 24(3):397–403. [PubMed: 20853924]
- Tonigan JS, Toscova R, Miller WR. Meta-analysis of the literature on alcoholics anonymous: Sample and study characteristics moderate findings. *Journal of Studies on Alcohol*. 1996; 57(1):65–72. [PubMed: 8747503]

- Twenge JM, Konrath S, Foster JD, Campbell WK, Bushman BJ. Egos inflating over time: A cross-temporal meta-analysis of the Narcissistic Personality Inventory. *Brain and Behavior*. 2008; 76(4): 875–902.
- Weiss RD, Griffin ML, Gallop RJ, Najavits LM, Frank A, Crits-Christoph P, et al. The effect of 12-step self-help group attendance and participation on drug use outcomes among cocaine-dependent patients. *Drug and Alcohol Dependence*. 2005; 77(2):177–184. [PubMed: 15664719]
- Worley M, Gallop R, Gibbons MBC, Ring-Kurtz S, Present J, Weiss RD, et al. Additional treatment services in a cocaine treatment study: Level of services obtained and impact on outcome. *American Journal on Addictions*. 2008; 17(3):209–217. [PubMed: 18463998]
- Zemore SE. A role for spiritual change in the benefits of 12-Step involvement. *Alcoholism: Clinical and Experimental Research*. 2007; 31(3):76–79.

Table 1

Study Participant Help-Seeking And Substance Use: Baseline and Follow-up (N = 130)

	Intake ¹	3 month	6 months	9 months
Help-seeking				
Proportion Days 12-Step attendance, <i>M (SD)</i>	.17 (.20)	.24 (.31)	.23 (.29)	.17 (.24)
% Attending 12-Step	100%	79.7%	78.9%	76.1%
Proportion Days Treatment, <i>M (SD)</i>	.07 (.14)	.12 (.19)	.11 (.20)	.09 (.17)
% Attending Treatment	58.9%	64.4%	58.8%	55.8%
Days Religious Attendance, <i>M (SD)</i>	3.76 (8.00)	6.14 (15.03)	4.57 (8.02)	3.88 (9.97)
Days Formal Education, <i>M (SD)</i>	3.84 (13.05)	3.20 (10.12)	3.32 (10.07)	5.60 (21.25)
NPI: Pathological narcissism	6.38 (3.67)	6.50 (3.51)	6.68 (3.71)	6.33 (3.78)
Substance Use				
PDA (alcohol), <i>M (SD)</i>	.56 (.31)	.72 (.32)	.74 (.30)	.72 (.32)
% Abstinent from alcohol	0%	19.5%	24.6%	25.7%
Drinks per Drinking Day (DPDD), <i>M (SD)</i>	14.01 (9.13)	9.67 (10.78)	8.84 (9.05)	8.60(8.80)

Table 2

Comparison of 12-step Sample Intake means (SD) NPI scores with General Populations means (SD) scores

	Total NPI Score	Pathological Narcissism Score	N
Twenge et al. (2008) meta-analysis	9.14 (4.67)	2.21 (1.93)	16, 475
12-step sample	16.98 (7.32)	6.38 (3.67)	130